

**ABSTRACT**

Systems, methods, and compositions achieve rapid closure of vascular puncture sites. The systems and methods form a vascular closure composition by mixing together a first component, a second component, and a buffer material. The first component includes an electrophilic polymer material having a functionality of at least three. The second component includes a nucleophilic material that, when mixed with the first component within a reaction pH range of between 7 to 9, cross-links with the first component to form a non-liquid, three-dimensional barrier. The buffer material has a pH within the reaction pH range. The systems and methods apply the composition to seal a vascular puncture site.